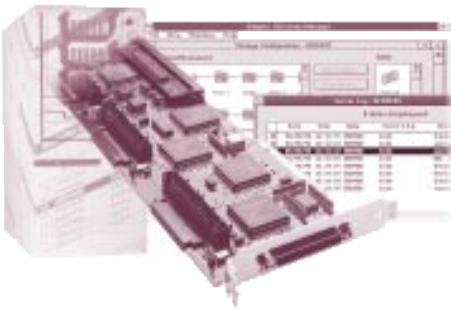


# ADAPTEC®

## ARRAY SOLUTIONS

# AAA-130 PCI-to-Wide UltraSCSI Array Adapter Series

**High-performance, cost-effective data availability  
for entry-level servers**



### PRODUCT HIGHLIGHTS

- Delivers data over the network faster than native operating system RAID software (mirroring, RAID 5)
- Connects Fast/Wide SCSI, UltraSCSI, and Wide UltraSCSI devices
- Supports RAID levels 0, 1 (mirroring), 0/1, and 5
- Makes installation quick and easy with Adaptec ArrayConfig™ software
- Simplifies remote array management with easy-to-use Adaptec® CI/O™ Array Management software

### Overview

Faced with the choice between either slow performance or the prohibitive cost of high-end array solutions, businesses deploying entry-level servers often settle for the data protection provided by native operating system RAID software (mirroring, RAID 5). Now they no longer have to compromise.

The AAA-130 series outperforms embedded mirroring/duplexing (RAID 1) and RAID 5 software provided by network operating systems. Plus the many extra features for improved storage system uptime, such as hot-swap and hot-spare drive support, make the AAA-130 series the preferred choice to optimize storage fault tolerance for entry-level servers.

The AAA-130 series includes three UltraSCSI array adapters to meet a wide range of connectivity, performance, and cost requirements.

The AAA-131 single-channel, half-size array adapter is a high-performance choice for systems that already have embedded SCSI or an installed add-in host adapter for low speed devices. The AAA-132\* dual-channel and the AAA-133 three-channel adapters deliver the equivalent performance of multiple array adapters in a single PCI slot. The multichannel feature of these adapters optimizes performance by allowing slower peripherals, such as CD-ROM and tape drives, to be isolated on a separate, independent channel, saving PCI slots and reducing the

need for a separate host adapter. These two multichannel adapters are also ideal for CD-ROM towers.

With the AAA-130 series, RAID does not have to be complex. All AAA-130 series adapters are easy to install and use. In addition, easy-to-use Adaptec CI/O Array Management software simplifies array management.

### Key Benefits

#### High performance

The AAA-130 array adapter series delivers data over the network faster than native operating system RAID software.

To achieve superior performance, the AAA-130 series takes advantage of the same basic high-performance design used for Adaptec's industry-leading multichannel PCI host adapters. Adaptec's unique PCI-to-PCI bridge architecture accelerates throughput from storage media to host CPU memory by creating an on-board PCI bus that moves data up to 133 MByte/sec. A separate RAID coprocessor offloads RAID 1 secondary writes and RAID 5 parity calculations from the host CPU, freeing it for other tasks.

#### Added features for enhanced data availability

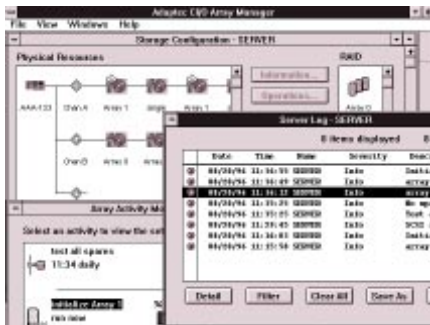
In addition to superior performance, the AAA-130 series delivers far more fault tolerance than operating system RAID software, providing round-the-clock data recovery from drive failures.

\*AAA-132 is only available through Adaptec OEMs.

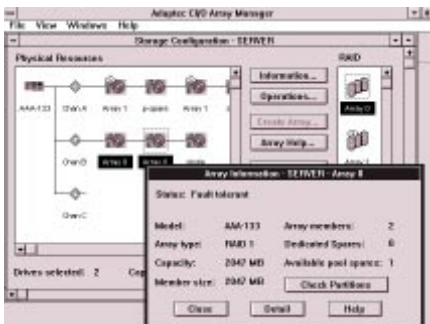
## Adaptec CI/O Array Management Software



Zero-in on individual servers and arrays



Keep track of everything that happens



Pick and click to reconfigure arrays

**Hot swap.** If the server storage enclosure supports the hot swapping of drives, so does the AAA-130 series. In environments where hot swap is not supported, the warm-swap utility of the AAA-130 array adapter permits I/O to be paused temporarily while a drive is replaced — no power-off and rebooting required.

**Hot-spare standby.** The AAA-130 series takes the crisis out of drive failure by supporting hot spares. Up to two hot-spare drives can be configured per array or a pool of up to eight spares can be established for all arrays to draw upon. Failover to a hot-spare drive is automatic. Data is reconstructed automatically in real-time without interrupting network users, and the priority of drive reconstruction can be defined.

**Boot from an array.** With the AAA-130 series, systems can be set up to boot from a disk array. This means the network operating system itself can be protected.

**Extended parity protection.** The AAA-130 series features a parity-protected RAID coprocessor, which maintains data integrity from the storage media to the host system.

**Dynamic sector repairing.** In addition to providing fault tolerance against disk drive crashes, the AAA-130 array adapter series protects against soft media errors (i.e. latent defects) by repairing damaged disk sectors on the fly. If data cannot be retrieved from a damaged sector, the adapter recovers automatically and transparently by assigning the data block to a spare sector on the disk (except RAID 0). Access is uninterrupted and no data is lost.

### Scalability for growth

Adaptec solutions are known for scalability and the Adaptec family of array products is no exception. The entire family of array solutions, including the AAA-130 series, leverages the same underlying high-performance architecture. Across the series and the entire Adaptec array family, Adaptec CI/O Array Management software provides cost-effective incremental growth in capacity and a seamless user interface that reduces the cost and effort of managing growing systems.

The AAA-130 series accommodates growing storage capacity requirements.

Storage systems can be configured initially with disk mirroring. Then, when rising storage requirements make mirroring too costly, systems can easily be reconfigured to RAID 5.

### Choice of RAID levels

An AAA-130 series array adapter supports up to four arrays in any combination of RAID 0, 1 (mirroring), 0/1, or 5 to meet the availability and performance requirements of different network applications.

RAID 0 stripes data across multiple disks without redundancy, speeding data access when performance is the top priority. RAID 1 mirrors data, providing full data redundancy but doubling the storage requirements. RAID 5 is an economical solution for protecting data at a much lower storage cost than mirroring. It provides the best overall balance of fault tolerance, performance, and storage cost for most transaction-oriented networks.

### Broad compatibility

Extensively tested in the Adaptec compatibility lab, the AAA-130 series supports Fast/Wide SCSI, UltraSCSI, and Wide UltraSCSI drives and other SCSI devices from all major vendors. The AAA-130 series is also compatible with all the most popular network operating systems. This extensive compatibility provides more choice in systems and peripherals while protecting company hardware and software investments.

### Simple installation

Simplicity is a hallmark of Adaptec array solutions. Just plug an AAA-130 series adapter into a PCI slot, run Adaptec ArrayConfig software, and follow simple menu-driven steps to configure the adapter. Adaptec ArrayConfig software enhances fault tolerance by allowing an initial array configuration to be set up before installation of the operating system.

### Convenient array management

The same array management software supports all Adaptec array products, providing seamless scalability and a built-in upgrade path. Adaptec CI/O Array Management software takes the complexity out of array management. It is the network managers' control center for monitoring and managing disk storage for the entire network.

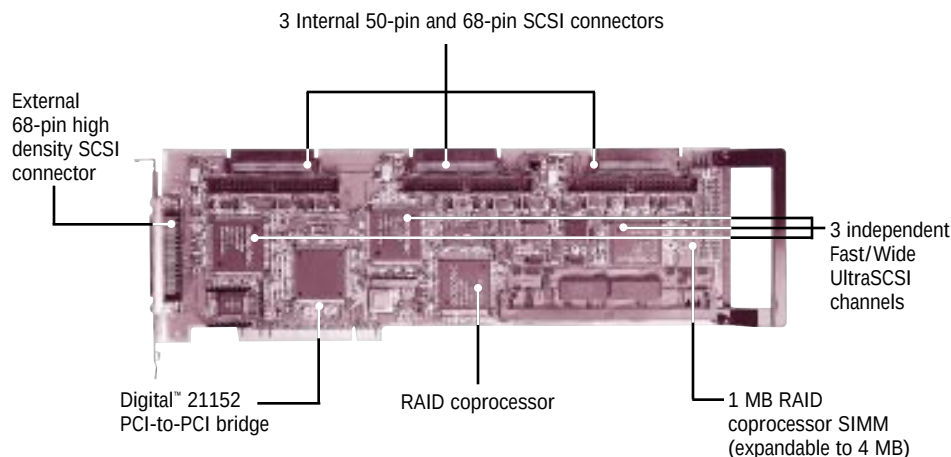
Arrays can be managed either locally from a server console or remotely from any PC on the network. In Windows® operating systems, Adaptec CI/O Array Management software provides an easy-to-use graphical user interface.

**See the big picture.** From a single location, network managers can view all the servers on the network that have AAA-130 series array adapters.

**Zero-in on individual servers and arrays.** Network managers can drill down to view any server of interest. They can see at a glance both physical and logical array configurations that belong to that server. Plus, the interface maps and monitors other SCSI devices on the AAA-130 series adapters as well as standalone hard disk drives.

**Keep track of everything that happens.** Alerts, color-coded by severity, keep network managers informed of all events throughout the network. Adaptec CI/O Array Management software captures detailed information, including the affected server, date, time, and a description of the event. Event logs are collected on each network server, not on the monitoring system. This means that all events are reported, even if the monitoring system has been shut down for a time.

**Pick and click to reconfigure arrays.** To reconfigure arrays from their PCs, managers simply highlight the desired number of drives. Adaptec CI/O Array



### AAA-133 PCI Array Adapter

(see table below for other models)

Management software presents allowable RAID level options. Then to help simplify the decision, bar graphs show the tradeoffs in data protection and performance for each option as well as the difference between available and required storage capacity.

For security, certain actions, such as deleting and reconstructing arrays, are password protected.

#### Troubleshoot problems remotely.

Without leaving their desks, network managers can:

- Determine which drives have failed
- Initialize arrays
- Reactivate offline arrays
- Verify parity information
- Blink individual drive lights or the lights of all drives in an array
- Pause I/O to permit the replacement of drives that are not hot-pluggable

Drives equipped with Self-monitoring, Analysis and Reporting Technology (S.M.A.R.T.) report predicted failures to Adaptec CI/O Array Management software. With this advance warning, network managers can activate a spare remotely before problems arise.

#### Schedule management activities.

Network managers can schedule activities, such as verifying all the disks in each array, testing spare drives, and reconstructing devices. These activities are carried out automatically, on schedule, whether the network manager is in attendance or not.

#### Adaptec quality and reliability

The AAA-130 series affords the same high standard of quality and reliability that has made Adaptec a market leader in I/O solutions.

As with all Adaptec products, Adaptec AAA-130 series has passed the comprehensive functional and mechanical inspections and tests in two separate laboratories: the Adaptec Product Test Lab and the Adaptec Compatibility Test Lab.

Adaptec's manufacturing facility has earned ISO-9002 international certification, which ensures compliance to a high level of quality in product design and production.

Trusted for quality and reliability, Adaptec products are incorporated into the products of virtually all major computer and peripheral manufacturers.

#### ADVANCED FEATURES

|                                                            | AAA-131<br>(Half-size) | AAA-132<br>(OEM only) | AAA-133 |
|------------------------------------------------------------|------------------------|-----------------------|---------|
| Number of independent SCSI channels                        | One                    | Two                   | Three   |
| RAID coprocessor                                           | YES                    | YES                   | YES     |
| Multiple operating system support                          | YES                    | YES                   | YES     |
| Data striping (RAID 0)                                     | YES                    | YES                   | YES     |
| Mirroring (RAID 1)                                         | YES                    | YES                   | YES     |
| Data striping with distributed parity (RAID 5)             | YES                    | YES                   | YES     |
| Hot-swap drive support                                     | YES                    | YES                   | YES     |
| Hot-spare standby                                          | YES                    | YES                   | YES     |
| Dynamic sector repairing                                   | YES                    | YES                   | YES     |
| Both 50-pin and 68-pin cables included-5 position          | YES                    | NO                    | YES     |
| Both 50-pin and 68-pin connectors on all internal channels | YES                    | YES                   | YES     |
| One 68-pin external connector                              | YES                    | YES                   | YES     |

## TECHNICAL SPECIFICATIONS

|                                                      |                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Computer Bus:</b>                                 | 32-bit PCI Local Bus                                                                                                                                                                                                                                                                |
| <b>Interface Protocol:</b>                           | Bus master DMA                                                                                                                                                                                                                                                                      |
| <b>Host Burst Data Transfer Rate:</b>                | Up to 133 MByte/sec burst rate                                                                                                                                                                                                                                                      |
| <b>SCSI Synchronous Data Rate:<br/>(Burst rates)</b> | AAA-131 — Up to 40 MByte/sec<br>AAA-132 (OEM only) — Up to 80 MByte/sec<br>(40 MByte/sec per channel)<br>AAA-133 — Up to 120 MByte/sec<br>(40 MByte/sec per channel)                                                                                                                |
| <b>Device Protocol:</b>                              | SCSI Ultra, Fast, and Wide (8- and 16-bit) 20 MHz                                                                                                                                                                                                                                   |
| <b>Advanced SCSI Features:</b>                       | SCSI PhaseEngine® coprocessor<br>Auto-termination<br>255 simultaneous commands<br>Scatter/gather<br>Tagged command queuing<br>Disconnect/reconnect<br>UltraSCSI 20 MHz for data transfer up to<br>40 MByte/sec per channel<br>Wide SCSI connection for up to 15 devices per channel |
| <b>Advanced Hardware Features:</b>                   | Both 50- and 68-pin internal connectors<br>68-pin external connector (internal-to-external converter<br>available)<br>Flash BIOS                                                                                                                                                    |
| <b>Electrical Drivers:</b>                           | Single-ended and active                                                                                                                                                                                                                                                             |
| <b>PCI Bus:</b>                                      | 32-bit, 33 MHz                                                                                                                                                                                                                                                                      |
| <b>SCSI Channels:</b>                                | 1, 2, or 3 fully independent PCI UltraSCSI channels bridged<br>to system PCI bus                                                                                                                                                                                                    |
| <b>Device Support:</b>                               | Up to 15 devices per channel                                                                                                                                                                                                                                                        |
| <b>Array Support:</b>                                | Drives can be supported in array or non-array configurations<br>Up to 4 arrays configurable per AAA-13x<br>Up to 16 drives per array<br>RAID levels: 0, 1 (mirroring), 0/1, or 5                                                                                                    |
| <b>Operating System Support:</b>                     | Windows NT™ 3.51, 4.0, NetWare 3.12, 4.1, 4.11,<br>IBM OS/2 Warp**, SCO OpenServer**, UnixWare**                                                                                                                                                                                    |
| <b>Remote Management:</b>                            | Windows® 3.x, Windows® 95, Windows NT 3.51, 4.0                                                                                                                                                                                                                                     |

## RECOMMENDED MINIMUM SYSTEM REQUIREMENTS

PCI-based 90-MHz Pentium or equivalent motherboard with PCI-to-PCI bridge support  
32 MByte system memory (NetWare)  
48 MByte system memory (Windows NT)

## PHYSICAL AND ENVIRONMENTAL SPECIFICATIONS

|                               |                                                    |
|-------------------------------|----------------------------------------------------|
| <b>Dimensions:</b>            |                                                    |
| AAA-131                       | 6.93 inches (17.602 cm) by 4.2 inches (10.668 cm)  |
| AAA-132 (OEM only)            | 12.28 inches (31.191 cm) by 4.2 inches (10.668 cm) |
| AAA-133                       | 12.28 inches (31.191 cm) by 4.2 inches (10.668 cm) |
| <b>Operating Temperature:</b> | 5°C to 55°C                                        |
| <b>Storage Temperature:</b>   | -60°C to 150°C                                     |
| <b>Humidity (operating):</b>  | 20% to 90%, non condensing                         |
| <b>Power Requirements:</b>    | 5V ± 5%                                            |

\*\*Available in subsequent releases. Free upgrade.

## COMPLETE KIT

- AAA-131 or AAA-133 PCI-to-Wide UltraSCSI array adapter
- Adaptec Array1000™ Family Manager Set software for Windows NT, OS/2,\*\* NetWare, SCO OpenServer,\*\* UnixWare\*\*
- Adaptec CI/O Array Management software
- Adaptec ArrayConfig initial boot array installation software
- One 50-pin and one 68-pin internal ribbon cable with active termination (external kit available)
- Complete documentation



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or (408) 957-7274

**World Wide Web:** <http://www.adaptec.com>

**Internet ftp server:** <ftp.adaptec.com>

**CompuServe:** GO ADAPTEC

### Adaptec USA Bulletin Board (BBS):

(408) 945-7727 (up to 28,800 bps,  
using 8 bits, 1 stop bit, no parity)

**Interactive Fax:** (408) 957-7150

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